The Birds and the Bees: How Sexual Behavior and Attitudes are Influenced by Sources of Sex Education

Undergraduate Research Thesis
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by
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Abstract:

From politicians to parents, everybody seems to have a stake in the conversation about sex education. Currently, teens get their knowledge about sex primarily from informal sources such as friends or the media, which can lead to unhealthy sexual behaviors and attitudes. Therefore it is important to explore the option of formal sex education to inform teens about safe and healthy sexual behaviors. Research has focused on parental communication and school sex education separately; both have been proven to be effective encouraging safe sexual behaviors. The purpose of this research is to explore the effects of communication with parents about sex and formal sex education together, on sexual behaviors and attitudes using the 1995 National Survey of Family Growth (NSFG). Ordinary least square regressions and logistic regression were used on the weighed data. Results indicate that having both sources of sex education actually lowers the age that a respondent had sex for the first time, but those respondents were almost twice as likely to use contraceptives than those who had no sex education. In terms of attitude, there is evidence to support that having both at-home conversation and in-school sex education lead to more sex positive sexual attitudes using a question on egalitarian sexual views. This analysis of the intersection of formal and informal sex education opens up a dialogue about how successful sex education should be defined and executed. Even though respondents tended to have sex younger with any kind of sex education, they held more egalitarian values than those who received no sex education and were more likely to use contraceptives.

Introduction:

In 2010, teenage pregnancy was at a record low and according to recent National Survey of Family Growth (NSFG) data, 78% of females and 85% of males used contraceptives during first sexual intercourse, an increase from a decade before (Martinez et al. 2011). Despite those optimistic findings, the United States is still leading the developing world in number of teenage pregnancies (McKay and Barrett 2010). A search for the ideal formula for the implementation of sex education continues in order to keep our youth from partaking in sexually risky behavior.

Children have been asking their parents the ever-dreaded question of "where do babies come from?" long prior to the sexual revolution of the 1960s, but the revolution brought conversation about formal sexual education into the public arena. In 1964, the Sex Information Education Council of the United States (SIECUS) was formed, with the goal of providing information to students and allowing them to steer their own decisions based on the knowledge they were provided (Moran 2003). Children were beginning to have conversations about sex outside the home without the controlled environment of their parents. The motivations of the movement were not always liberal; nonetheless it was the first of its kind with comprehensive sex education initiatives. The initiative was driven by the need for sex to be taught in a safe and educational environment and to produce a physically and mentally healthier generation. In response, many evangelical institutions in the 1980s began to formulate their alternatives to comprehensive sex education, their retaliation being abstinence-only education.

Due to their efforts, The Adolescent Family Life Act (AFLA) of 1981, led by the Reagan administration, was the first act to especially allocate federal funds to programs that advocate for abstinence-only education. Since then there have been several federal initiatives to fund abstinence-only education including Community-Based Abstinence Education (CBAE) and Title

V programs. Analysis of the programs implemented in the 1990s showed that the goal of these organizations, to lower sexual activity and its negative consequences, was not achieved (Trenholm 2008). Trenholm's study showed little to no difference in contraceptive use, pregnancy rates, or age of first sex between the group receiving abstinence-only education and the control group. Abstinence-only education funding has been substantially cut in the past couple of years due to an increase in studies that aim to evaluate its worth. Analysis of the National Survey of Family Growth found that abstinence-only sex education showed no change in teenage pregnancy, but students receiving comprehensive sex education were less likely to get pregnant in their teens (Kohler et. al. 2008). Similarly, teens that have taken virginity pledges tend to sex later, but are less likely to use contraceptives and realize signs of STD's (Bruckner et. al. 2005). It is evident that a certain type of approach to sexual education may have favorable results in age at first sex, but increasing the presence of risky sexual behaviors. Both AFLA and CBAE lost funding through the Consolidated Appropriations of 2010, following Obama's health care reform, but funding still exists that allocates money to abstinence-only sex education.

The past fifty years have opened the door to evaluation of sexual trends in the United States. The National Survey of Family Growth (NSFG) has been widely used to evaluate sex education, as it offers an extensive range of questions allowing for an in depth analysis of sexual behavior outcomes. Particularly, researchers such as Dr. Gladys Martinez Ph.D. have explored the different sources of sex education and how students obtain their knowledge (Martinez et. al. 2010). I aim to look at the interaction between at-home and in-school sex education and how that affects respondent's sexual behaviors and attitudes.

Theory and Hypothesis:

There is extensive research about the individual effects of parental communication about sex and in-school sex education on sexual behaviors. Among the activities that SIECUS defines as "risky sexual behavior" are early initiation into sex and low contraceptive use (Haffner 1995). Most research that looks into the efficacy of sexual education programs uses age of sex initiation (what I defined as "age at first sex") and contraceptive use as measures of risky sexual behavior. Age at first sex in itself does not necessarily signify risky behavior, but it is important to consider because sex in middle school can lead to riskier sexual practices such as unprotected or intoxicated sex (Martin et al. 2005). Dr. Joseph Sabia analyzed effects of sex education using the National Longitudinal Study of Adolescent Health where he found results that point to arguments on both sides of the ideological spectrum. There is some evidence of sex education being linked to lower age at first sex and unprotected sex, but using longitudinal data it is evident that this is not a casual relationship. Therefore, having sex education is not shown to cause adverse health side effects, but it also does not achieve the policy makers' goals of decreasing risky sexual behavior (Sabia 2006). Contrary to Sabia's findings, many other researchers find evidence to suggest that formal sex education can delay age at first sex, encourage use of contraceptives, and prevent teenage pregnancy (Jones 1985, Lindenberg et. al. 2012), but the timing of the sex education and differing definitions of effective sex education can change the results. The strongest evidence suggests that comprehensive sex education is the most effective in delaying age at first sex and encouraging contraceptive use (Kirby 2008).

There has also been work exploring how informal sex education effects sexual behavior. Informal sex education can come from a variety of sources, including parents, peers, and media. This informal education has been shown to sometimes have a stronger effect than at-school sex

education (Spanier 1976). The focus of this analysis will be on the behavioral effects of conversation with parents regarding sexual education. Research looking at parent-child communication about sex has been shown to delay age at first sex, especially when that conversation is labeled as comfortable (Guzman et al. 2003). Specifically, conversations with parents over other informal information outlets have been shown to delay age of first sex (Bleakly 2010), suggesting that the combination of both at-home and in-school sex education can lead to optimal results. The challenge with encouraging parents to communicate about sex to their children is that parents often find it uncomfortable, based on their gender, age, and other socio-demographic factors (Jerman 2010, Guilama-Ramos et. al. 2008). Providing support to these parents, allowing them to be able to properly relay information may be the best route to a holistic and educational approach.

Parents carry a great strength in building their children's values and beliefs, particularly when it comes to children's views on sex. Some parents encourage liberal attitudes about sex, or leave it completely out of the conversation. I define liberal attitudes about as egalitarian views about sex, focusing on pleasure for both parties involved rather than sex solely for reproduction. Sex education programs (primarily abstinence-only curricula) do not often make it a focus to encourage sex-positive outlooks; the focus has often been on reproduction rather than pleasure. Particularly for women, it can be beneficial for students to get information about female sexual pleasure, which is not part of our public discourse (Fine 1988, 2006). Dr. Rebecca Ferguson (2008) compares the US and the Netherlands; the Netherlands is often idealized in terms of their sexual education, as they have higher contraceptive use and a much lower teen pregnancy rate. Their curriculum also includes information on sexuality, pleasure, sexual violence and communication, which has been credited for the Netherlands' overall better sexual health

outcomes. Similarly, evaluating programs around the world that advertise safe sex as well as good sex provide evidence for higher contraceptive use, which could lead to better health outcomes (Philpott et al. 2006). It would be interesting to explore whether any kind of exposure to sex education or sexual discourse can facilitate familiarity and comfort towards the topics of sex and therefore be a pathway to more liberal attitudes.

Using a larger data set such as the National Survey of Family Growth provides statistical power, even if it does not follow a particular program or cohort; it measures the attitudes and behaviors of a representative sample of women in the United States. Given previous research conducted using the NSFG, results that portray the benefits of both sources of sex education are expected. If this approach does not prove to be successful, it is time to look at factors outside the scope of sex education to explain the high pregnancy and STD rates in the United States. I hypothesize that the combination of school sex education and at-home parental communication about sex will significantly delay age at first sex, increase contraceptive use at first sex, and encourage egalitarian sexual attitudes, more than either method independently.

Methods:

The 1995 National Survey of Family Growth (United States Department of Health and Human Services 1995) includes 10,847 noninstitutionalized women aged 15 to 44; Black and Hispanic women were oversampled. Using the 1995 wave means that these women went through formal or informal sex education approximately between the years 1961 and 1995. This time span includes a shift in sex education programs and how they were implemented. The goal of the National Survey of Family Growth is to track information about women's health and fertility patterns on behalf of the National Center for Health Statistics. Although the NSFG was

conducted multiple times beginning in 1973 and continuing through today, the prevalence of questions about sex education made the 1995 wave (Cycle 5) ideal for testing my hypothesis.

The three main dependent variables used in my models are "age at first sex" (actual years), the question of egalitarianism in sexual relationships, and contraceptive use. The person interviewed was asked for the age at which they experienced sexual intercourse with a man for the first time. In order to account for involuntary sex that was not discounted in the control variable, this variable was recoded to only count those who had sex when they were 13 years old or above. A general attitude on heterosexual sex is was measured using an opinion item asking for agreement with the statement "Sex seems to exist mainly for the man's pleasure," responses ranged from 1= "strongly agree" to 4= "strongly disagree." Lastly, contraceptive use was made into a dummy variable as a composite of using any kind of contraceptive method versus no method at all; coded as 1= Used contraceptive at first sex and 0= Did not use contraceptive at first sex.

The main independent variables include the sources of sexual education: both at-home and in-school sex education, only at-home sex education, only in-school sex education, and neither at-home nor in-school sex education. Dummy variables were created for each category, with those receiving education from neither source serving as the reference group in the models. In order to determine whether a respondent had conversations at home with their parent or guardian about sex, the respondent was asked "[Before you were 18, had] Have you ever talked with a parent or guardian about methods of birth control (1) and sexually transmitted diseases (2)?" The responses to these questions were combined into one dummy variable: 1 = yes to either or both, 0 = no to both. Next, the respondent was asked, "I'm interested in knowing about formal sex education you may have had… about… methods of birth control (1) and sexually transmitted

diseases (2)?" Similarly to at-home sex education, these responses were coded into one dummy variable.

I controlled for age at interview, race, voluntary or involuntary first sex, importance of religiosity, religious affiliation, region, and education. Age at interview ranged from 15-44 years. Dummy variables were created for race and White was used as a reference group for these variables. Due to the small number of Alaskan Natives and Asian or Pacific Islanders, those responses were coded into an "Other" group. In order to account for religiosity, respondents were asked "How important is religion in your daily life?" prompted with answers ranging from 1= "very important" to 3= "not important." The NSFG religion variable offered many denominations and groups within those denominations, therefore that variable was recoded into seven religious groups within which the respondent was raised: No religion, Evangelical, Protestant, Catholic, other Christian religions, Jewish, Non-Christian/Non-Jewish[1]. For this analysis, "No Religion" was used as a reference group. To account for the geographical environment in which the respondent was raised, I used a variable that indicated where the respondent was born: Midwest, South, West, or Northeast. I use Northeast as a reference category. Finally, education is a continuous variable ranging from 0-19+ years of education.

Ordinary least squares regressions were used on weighted data to test the relationships of sources of sex education to both age of first sex and sexual attitudes. Logistic regression was used on weighted data to test the effects of sources of education on contraceptive use at first sex.

[1] Religions were compressed or renamed as follows: No religion: Atheist, agnostic, none; Evangelical: Baptist; Protestant: Fundamentalist Protestant, Methodist, Lutheran, Presbyterian, Episcopal, Church of Christ, Methodist, Lutheran, Presbyterian, Episcopal, Non-denominational Protestant, Other Protestant, and Protestant, denomination unspecified; Catholic: Roman Catholic; Other Christian Religions: Mormon.

To observe mediating factors, regression was also used to explore the addition of controls to the bivariate regression.

Results:

Table 1: Descriptive Statistics

Variables	Unweighted N	Percent
Dependent Variables		
Age at first sex (Mean and Standard Deviation)	9,788	17.36, 3.16
"Sex exists mainly for the man's pleasure" (Mean and Standard Deviation)	10,713	2.95, 0.76
Used Contraception at First Sex	**9,881**	
Yes	5,527	55.90%
No	4,354	44.10%
Independent Variables		
Highest School Grade/Year Attended (Mean and Standard Deviation)	10,847	13.02, 2.69
How Important is religion in daily life (Mean and Standard Deviation)	10,842	1.59, 0.67
R's Age at Interview (Mean and Standard Deviation)	10,847	30.59, 8.31
Type of Sex Education	**10,734**	
Both at-home and in-school sex education	4,014	37.00%
Only at-home sex education	802	7.40%
Only in-school sex education	3,520	32.50%
Neither at-home or in-school sex education	2,398	23.10%
First Sex Voluntary	**9,754**	
Yes	9,090	84.00%
No	664	13.00%
Region Raised	**9,650**	
Northeast	1,971	20.42%
Midwest	2,690	27.88%

South	3,287	34.06%
West	1,702	17.64%
Race	**10,818**	
Black	2,494	23.00%
White	7,681	70.80%
Other	643	5.90%
Religion Raised	**10,819**	
No Religion	785	7.20%
Evangelical	2,777	25.60%
Protestant	3,307	28.00%
Catholic	3,687	34.00%

Table 2: Age of First Sex Regressed on Source of Sex Education and Controls

Variables	Unstandardized Coefficient	Standard Error
Both at-home and in-school sex education	-0.32***	0.10
Only at-school sex education	-0.04	0.10
Only communication with parents	-0.23+	0.14
1st sex voluntary	1.41***	0.14
How important is religion in R's daily life	-0.46***	0.05
Born in Midwest	0.13	0.09
Born in South	0.04	0.10
Born in West	-0.04	0.11
Highest school grade/year attended	0.37***	0.01
R's Age at interview	0.08***	0.00
Race: Black	-0.71***	0.08
Race: Other	0.04	0.20
Raised Evangelical	0.2	0.13
Raised Protestant	0.39***	0.12
Raised Catholic	0.51***	0.12
Raised Other	0.48+	0.22
Constant	9.26	0.29
F	128.45***	
Weighted N	8,450	
Adjusted R^2	0.24	

Sig: *** $p \leq .001$, ** $p \leq .01$, + $\leq .1$

Note: "Race: White," "Raised No Religion," and "Had neither in school or at home sex education" are omitted variables.

Ordinary least squares regression analyses show that, contrary to my hypothesis, having both at-home and in-school sex education decreases the age at first sex by .32 years (p = .001), relative to having no sex education. Having sex education only at school was not significant and only at home was .23 years younger (p = .087) compared to not having any sex education. One of the biggest predictors of age at first sex was being Black, Black teens had sex .71 years (p=0.00) before White teens, controlling for other factors. Respondents whose first sex was voluntary had sex later than those whose first sex was not voluntary (b = 1.41, p = 0.00). There was no significant difference evident in the data for individuals raised within different regions of the U.S.

When looking at the bivariate relationship without any of the controls, it appears that having sex education both at home and in school decreases age at first sex by 1.40 years (p=0.00). When adding in age at which respondent was interviewed, the value goes to .48 years earlier (p=0.00), this can mean that age mediates much of the relationship between sex education and age of first sex.

Table 3: Contraception Use Regressed on Sources of Sex Education and Controls

Variables	Odds Ratio	Standard Error
Both at-home and in-school sex education	1.86***	0.14
Only at-school sex education	1.14+	0.08
Only communication with parents	1.43***	0.15
1st sex voluntary or non-voluntary	1.43***	0.15
How important is religion in R's daily life	0.99	0.04
Born in Midwest	0.93	0.07
Born in South	0.87+	0.07
Born in West	0.67***	0.06
Highest school grade/year attended	1.19***	0.01
R's Age at interview	0.96***	0.00
Race: Black	0.53***	0.04
Race: Other	0.75+	0.11

Raised Evangelical	1.50***	0.17
Raised Protestant	1.47***	0.16
Raised Catholic	1.23**	0.13
Raised Other Religion	1.28	0.20
Constant	0.304***	0.08
Chi-square (df)	572.89 (16)***	
Weighted N	8,504	

Sig: *** p ≤ .001, ** p ≤ .01, + ≤ .1
Note: "Race: White", "Raised No Religion", and "Had neither in school or at home sex education" are omitted variables.

Logistic regression was used to determine the effect different sources of sex education have on whether contraception was used at first sex. My hypothesis was supported; students who received both at-home and in-school sex education were 1.88 (p=0.00) times more likely to use any method of contraception than those who received no sexual education. This appears to be a bigger effect than having only at-school and only at-home as well, which are 1.14 (p=0.06) and 1.43 (p=0.001) respectively. Even when controlled for sexual education, those who identify as Black have an odds ratio of 0.53 (p=0.00), meaning they are just over half as likely to have used contraception as Whites. These results are consistent with health outcome trends in the United States that show that minority populations often experience worse health outcomes regardless of class (Williams and Sternthal 2010).

Table 4: Egalitarian Sexual Attitude Regressed on Source of Sex Education and Controls

Variables	Unstandardized Coefficient	Standard Error
Both at-home and in-school sex education	0.17***	0.03
Only at-school sex education	0.05+	0.03
Only communication with parents	0.14***	0.04
How important is religion in R's daily life	0.05***	0.01
Born in Midwest	-0.05**	0.02
Born in South	-0.09***	0.02
Born in West	-0.08**	0.03
Highest school grade/year attended	0.06***	0.00
R's Age at interview	0.00	0.00
Race: Black	-0.17***	0.02
Race: Other	-0.16***	0.05
Raised Evangelical	-0.02	0.04
Raised Protestant	0.05	0.04
Raised Catholic	0.05	0.04
Raised Other Religion	-0.05	0.05
Constant	2.00***	0.08
F	44.40***	
Weighted N	9,385	
Adjusted	0.08	

Sig: *** $p \leq .001$, ** $p \leq .01$, + $\leq .1$
Note: "Race: White", "Raised No Religion", and "Had neither in school or at home sex education" are omitted variables.

Table 4 supports my hypothesis; respondents were closer to the "disagree" answer of the question "Sex exists mainly for the man's pleasure" if they had both at-home and in-school sex education. Relative to no sex education, having only in-school sex education ($b = 0.05$ $p = .034$) makes the respondent closer to agreeing with the statement compared to only at-home sex

education, meaning the scale is lowered 0.05 points towards 1=strongly agree. The relationship is strongest with the combination of both sex education sources. These numbers do not present a particularly strong relationship, but what is notable is the combination of the two sources presents the most effective climb toward strongly disagreeing with this statement.

Discussion:

The results indicate that having any kind of sex education actually lowers the age that a respondent had sex for the first time, but I argue the conclusion cannot be that their sex education has failed them. The analysis indicates that having both at-home and in-school sex education increases any kind of contraception usage at first sex. In terms of attitude, my hypothesis was supported and having both at-home and at-school sex education did make respondents more likely to disagree that "sex exists mainly for the man's pleasure," especially when it was taught both at home and in school. Having only communication with parents lowered the age at first sex but encouraged egalitarian sexual attitudes; that could indicate room for exploration. Future research could include looking into what kind of information is passed on from parents. Even though respondents tended to have sex younger with any kind of sex education, they held more egalitarian values than those who received no sex education.

These analyses of the 1995 NSFG support previous research on racial health disparities, particularly when it comes to sexual health. Black women have sex earlier than White women, and both Black and other minority women are almost half as likely as Whites to use contraception. Health disparities persist over time and health outcomes; therefore it is not surprising to see that a similar trend is evident in sexual behavior. The results are also reflected in rates of teenage pregnancy; in 2010 the rate of teenage pregnancy for non-Hispanic whites

was 37.8 in 1,000 births versus 99.5 in 1,000 for Black women (Kost and Henshaw 2014). As suggested by Bruce G. Link, Ph.D. and Jo Phelan Ph.D. (1995), policy makers should focus less on proximal determinants of health (i.e. health behaviors) and more on social conditions that may be the driving mechanisms for these poor health behaviors. From this survey it was not possible to know what kind of sex education these students were receiving, but it would be interesting to pursue the amount of money allocated in different school districts to sex education based on the minority status of the schools' population. Also observing the interaction between race and sources of education, how do these sources of education work within the health disparities?

One of the most prevalent limitations is that the NSFG 1995 was only administered to women, and due to the difference in socialization of males and females in our society, effects of these methods of education may be different when accounting for gender. Further research into, particularly, at-home conversations about sex should not only consider gender, but also family dynamics and the gender of the parents/guardians. Also, there is no variable to use to control when respondents had these conversations either at school or at home, so we cannot tell whether it was before or after they had sex for the first time. Therefore, it is hard to draw direct causality between sex education and these behaviors and attitudes. The NSFG 1995 offered no variable to control for sexual identity and only asked about male sexual partners, adolescents who do not fit into the traditional gender and heterosexual dichotomy may experience sex education differently due to the fact that few programs tend to cover non-heterosexual sexual practices and relationships. The exposure that students get to non-heterosexual sexual practices would be an interesting way to reproduce this particular analysis. The 1995 NSFG looked at sex education between the years of 1961 and 1995, during that time there was drastic change in policy and implementation, therefore that may create a large variability in results. This is supported by the

addition of age at interview in the bivariate model; this appears to explain much of the decrease in age at first sex. A deeper look at age cohorts and what kind of sex education policy had been implemented during the respondent's years in school may provide more optimal results. These optimal results may align with previous research to say that comprehensive sex education leads to later age at first sex. The policies that encouraged curriculum with parental communication may deem to be most effective using that analysis.

In terms of measuring egalitarian sexual attitudes, this can be expanded beyond the one question of "sex exists mainly for the man's pleasure," and even though my hypothesis was supported, I would encourage further research into sexual attitudes after sex education to include more in-depth questions about sexual perceptions, feelings, and thoughts. Particularly how programs that facilitate conversation about sexual pleasure for both parties contribute to attitudes that students hold about sex, and maybe what kind of results that may lead to. It would be desirable to be able to control for exact state geography as well because sex education policy is a state-level issue, therefore it would be easier to evaluate where these processes work. Certain programs that may result in fewer teenage pregnancies work in one state may not transfer to another due to social and demographical differences as well as policy (Yang 2010). This kind of analysis would create a better framework to attract all adolescents and their families to communicate openly about sex at home and at school.

Despite these limitations, there is much to gather from data that contradicts the hypothesis. I hypothesized that age at first sex would increase if the respondent had any sex education, especially with the combination of both sources. My motivations were driven by the goals of the policy makers who allocate funds to sex education programs, especially those during the time at which these cohorts received their education, many of which were abstinence only. I

suggest several reasons for that phenomenon; including the true purpose of sex education and the implications of delaying sexual activity. As previous mentioned, having consensual sex at a young age does not necessarily have to constitute as risky behavior. What makes early sexual actions risky is the lack of awareness of one's own sexuality and emotions, little information on contraception, and spread of STDs. Therefore targeting the core problems of what makes sexual activity an unhealthy behavior in adolescents and evaluating those results may lead to more favorable outcomes; i.e. decrease in teenage pregnancy and STD rates. A more recent analysis of the NSFG had lead to more favorable results regarding the effect sex education has on age at first sex, therefore the next step would be to check my hypothesis on recent cycles. I am not able to see what kind of sex education was provided, either at home or in school. To add to previous research, I was able to find more consistent results with the combination of sex education methods in contraceptive use and sexual attitudes. These methods are supported by the data, meaning that programs in the future should consider merging at-home involvement into the formal sex education process for a more holistic approach. Connecting these two outlets may lead to more comfort around the topic of sex, with the right programs and research; adolescents will shape a safer and more sex-positive future.

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